



## Clayoquot Salmon Crisis

### *Searching for Answers*



Photo: Raincoast Research

*Wild chum salmon with sea lice*

Wild salmon and steelhead in Clayoquot Sound are in crisis. The rugged west coast of Vancouver Island once thrived with abundant wild salmon and steelhead. Bringing nutrients back from the open ocean, these fish fed whales, wolves, bears, trees in old growth forests, and also native people and early settlers who grew strong and prosperous from the reliable bounty. Until quite recently this story changed very little.

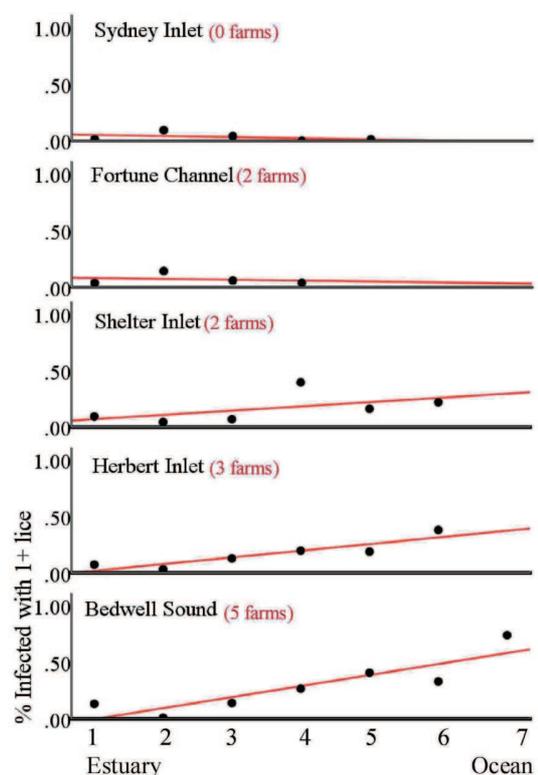
The prevailing expert opinion regarding the decline of salmon in the northwest is the degradation of their freshwater habitats. Hundreds of millions of dollars have been and continue to be spent on restoring habitat with the assumption that if habitats are healthy the salmon runs will also be healthy. Clayoquot Sound, with its many excellent (and some untouched) habitats, breaks this assumption. Something in Clayoquot Sound is broken and Wild Fish Conservancy (WFC) is searching for answers.

One thing that has recently been changing in the deep fjords of Clayoquot Sound is the introduction of a vast array of Atlantic salmon net pens. Around the world and in other parts of British Columbia, these salmon aquaculture facilities have been found to have a devastating effect on wild fish populations.

After considerable consultation with prominent BC scientists and conservation organizations, WFC launched a research project to help gather much needed information on the effects, if any, the aquaculture operations in Clayoquot Sound are having on wild salmon and steelhead. Previous research in BC has been conducted on the sheltered inside passage. Clayoquot Sound, on the west side of Vancouver Island, with direct exposure to the Pacific Ocean, is a far different habitat type and adds great diversity to the body of research. WFC wanted to help our colleagues in BC expand the geographic area of research

so a stronger case could be made for better aquaculture management. In late winter 2009, we began five months of intensive research. So far, the trends in our data show a disturbing correlation between the abundance of sea lice infestation on juvenile out-migrating wild salmon and the number of Atlantic salmon net pens they encounter on their way to the ocean.

The presence of sea lice on returning adult salmon is common and generally harmless, but the presence of sea lice on fragile juvenile salmon can be deadly. Under normal conditions wild juvenile salmon would rarely encounter sea lice.



*Infection rates for chum salmon from inlets with farms: Shelter (2 farms), Herbert (4 farms), Bedwell Sound (5 farms) and Fortune (2 farms) and inlets without farms: Sydney. Chum fry in fjords with multiple salmon farms had higher sea lice infection rates on their journey to sea than fry migrating down fjords with few or no farms.*

So far, WFC has collected one year of data, which isn't enough to fully understand the variability of sea lice infections over time. WFC plans to continue this research for at least one more year to capture that important variability. The results will be published in a prominent scientific journal, adding to the findings of researchers in other parts of BC. This work is important and timely. As debates continue regarding how best to manage commercial aquaculture, the information gained from our research will help politicians and resource managers make informed and responsible decisions.

It is inevitable that Atlantic salmon net pens will attempt to expand throughout the northwest. As we write this request, a new facility is being considered by the Macah Tribe for Neah Bay. The research that is being conducted in BC will be applicable throughout much of the region and will help us make wiser, more educated decisions. The proponents of Atlantic salmon net pens argue that problems that have occurred elsewhere in the world are not likely to happen here. But the scientific evidence is growing and it suggests the Pacific Northwest is highly susceptible to many of the same problems that are found elsewhere. Sound scientific research, coupled with an informed public, is the best insurance policy to protect the Pacific Northwest salmon and steelhead.

## Wild Fish Conservancy Clayoquot Sea Lice Project, year two. 2010 Outlook

In 2009, Wild Fish Conservancy asked whether sea lice were present on juvenile chum and chinook in Clayoquot Sound, and if so, whether the intensity of lice infection correlated with the location and concentration of salmon aquaculture facilities in Clayoquot's inlets.

Preliminary analysis of the 2009 data show that there is indeed a sea lice story in Clayoquot Sound—a story that needs to be further explored. A robust time series data set for juvenile chum salmon in all of Clayoquot's inlets shows infestations of greater intensity in inlets with more salmon farms than in inlets with fewer farms when temperature and salinity were similar. A second year of robust research in 2010 would help capture more environmental variability, and solidify the chum story inside the Sound, enough for peer review and publication in 2011.

The issue of sea lice infestations in Clayoquot Sound does not end inside the sound, nor does it impact only chum salmon. In 2009, WFC found that lice on chum salmon matured to a reproductive (thus re-infective) stage before fish were large enough to head into the open ocean. WFC hypothesizes that fish exiting Clayoquot via different inlets may aggregate in productive rearing areas such as Hesquiat harbor north of Clayoquot Sound, where lice infestations could amplify and spread to previously un-infected fish. Investigation into this potential is an important next step in our understanding of the continuing impact sea lice infestations have on salmon stocks in Clayoquot Sound.

Chinook salmon fry were scarce in Clayoquot Sound in 2009—a total of 550 fry were collected across sampling sites and seasons. While the data are sparse, what they suggest is compelling. Chinook fry, like chum, experienced higher infection rates (up to 60% infected) in inlets with many farms than those with fewer (up to 5% infected) though sample sizes were very small. In 2010, WFC plans to actively target chinook to develop a more robust dataset on this important species.

This graph is from the *2009 Southern B.C. Salmon Post Season Review - IHPC Jan. 19-20/2010* report from Fisheries and Oceans, Canada. The graph indicates Wild Chinook status remains low across all of west coast Vancouver Island and highlights particular concern for Clayoquot Chinook, which are in critical shape. This report brings both biological and political attention to the Clayoquot chinook problem. We believe that our proposed research is timely and may shed light on at least one of the causes for their decline.

